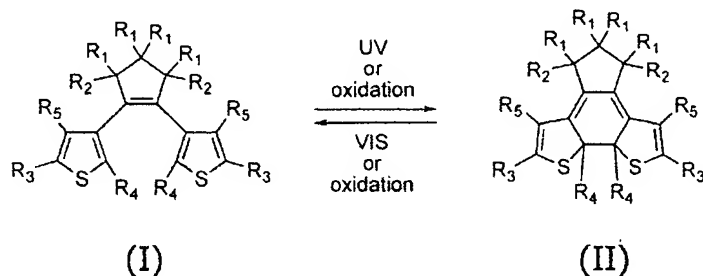


AMENDMENTS TO THE SPECIFICATIONS

Please replace the first paragraph on page 4 with the following amended paragraph:

The invention relates to a compound selected from the group consisting of compounds reversibly convertible under photochromic and electrochromic conditions between a ring-open isomer (I) and a ring-closed isomer (II):

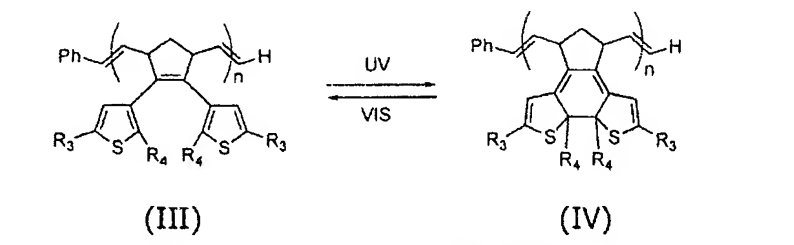


wherein R_1 is selected from the group consisting of H and a halogen; R_2 is selected from the group consisting of H, a halogen, $\text{CH}=\text{CH}$ and a polymer backbone; R_3 is selected from the group consisting of H, a halogen, CO_2Y ($\text{Y}=\text{H}$, Na, alkyl, aryl), and X ($\text{X}=\text{N}, \text{O}, \text{S}$); R_4 is selected from the group consisting of alkyl and aryl; and R_5 is selected from the group consisting of H, alkyl and aryl. In one embodiment of the invention R_1 and R_2 are preferably F. In another embodiment R_1 is H and R_2 forms part of a cyclic structure (i.e. R_2 is $\text{CH}=\text{CH}$).

Please replace the paragraph starting at line 11 on page 5 with the following amended paragraph:

The compounds of the invention may be in either a monomeric or polymeric form. The polymeric form may be a homopolymer produced by ring-opening metathesis polymerization (ROMP). The homopolymer may include the active photochromic component

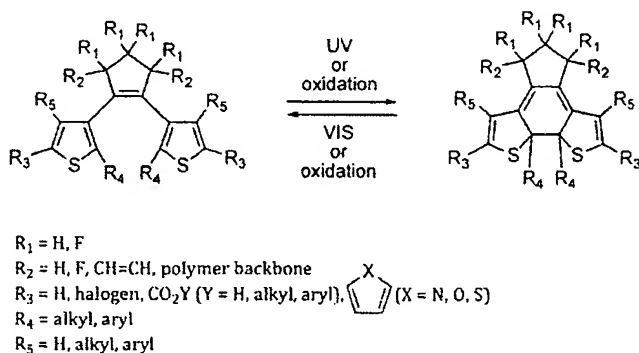
as either a side-chain or the main-chain of the polymer. In the latter case the central ring of the photochromic 1,2-bis(3-thienyl)cyclopentene may be incorporated directly into the polymer main-chain to form an ultra-high density polymer interconvertible between isomeric forms (III) and (IV) as shown below:



where R_3 is as described above and may, for example, consist of halogen, CO_2CH_3 or CO_2H .

Please replace the last paragraph on page 9 with the following amended paragraph:

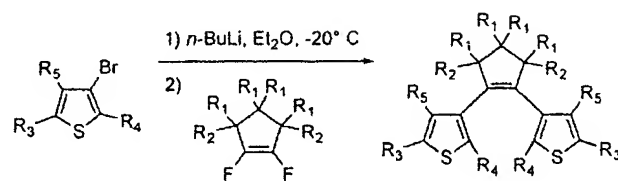
This application relates to 1,2-dithienylcyclopentene derivatives having the general structure shown in Scheme 1 below:



Scheme 1

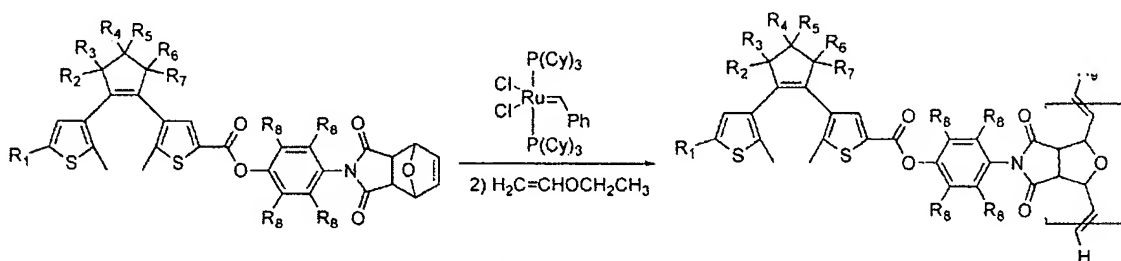
As described in detail below, this application also relates to methods of synthesizing and using the compounds, including both polymer and monomer precursors.

Please replace the structural moiety labeled Scheme 2 at the bottom of page 10 with the following replacement structural moiety:



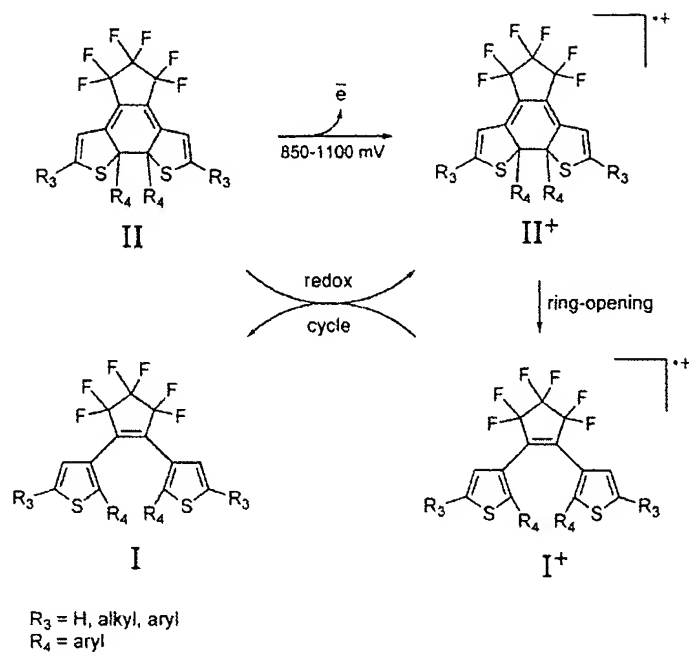
Scheme 2

Please replace the structural moiety labeled Scheme 3 at the top of page 12 with the following replacement structural moiety:



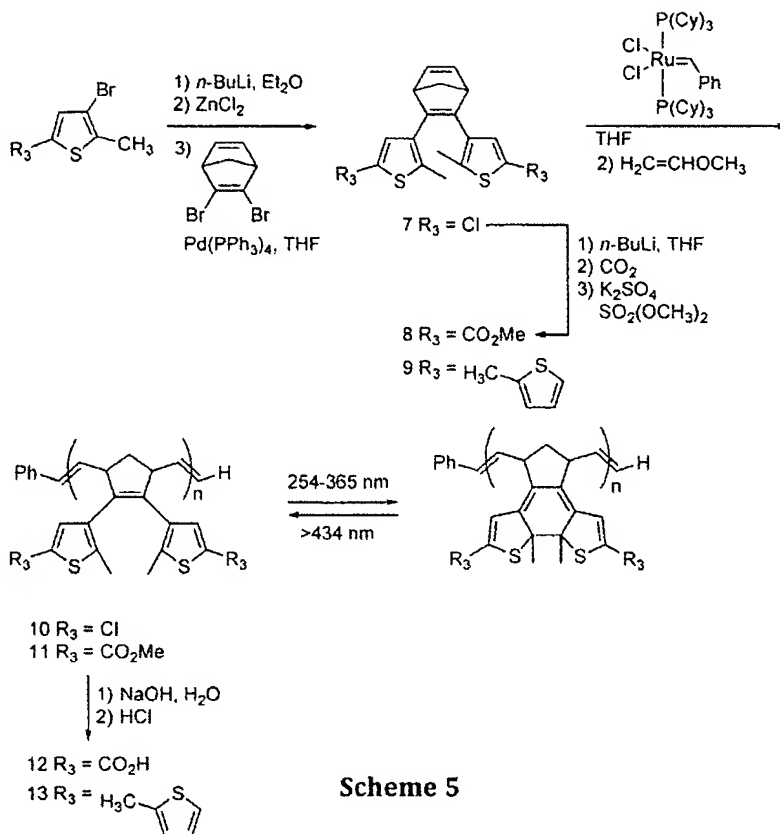
Scheme 3

Please replace the structural moiety labeled Scheme 4 at the middle of page 12 with the following replacement structural moiety:

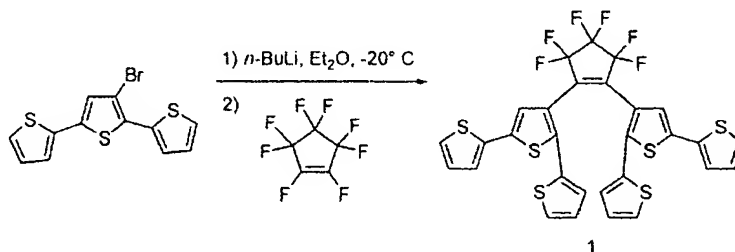


Scheme 4

Please replace the structural moiety labeled Scheme 5 at the middle of page 14 with the following replacement structural moiety:

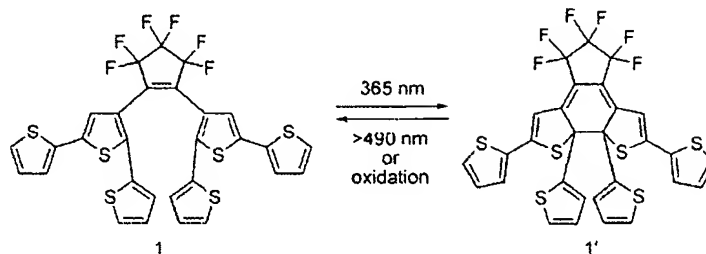


Please replace the structural moiety labeled Scheme 6 at the top of page 18 with the following replacement structural moiety:



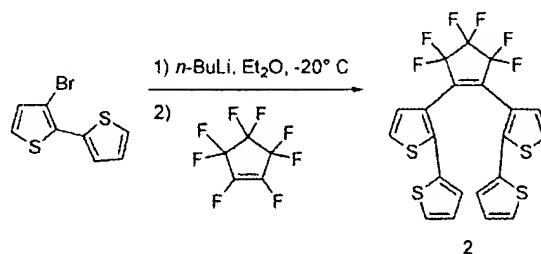
Scheme 6

Please replace the structural moiety labeled Scheme 7 at the top of page 19 with the following replacement structural moiety:



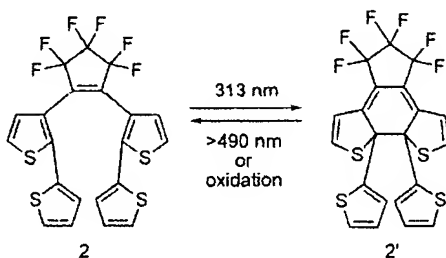
Scheme 7

Please replace the structural moiety labeled Scheme 8 at the middle of page 22 with the following replacement structural moiety:



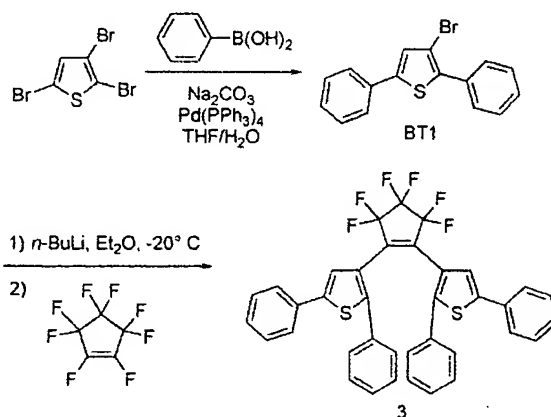
Scheme 8

Please replace the structural moiety labeled Scheme 9 at the middle of page 23 with the following replacement structural moiety:



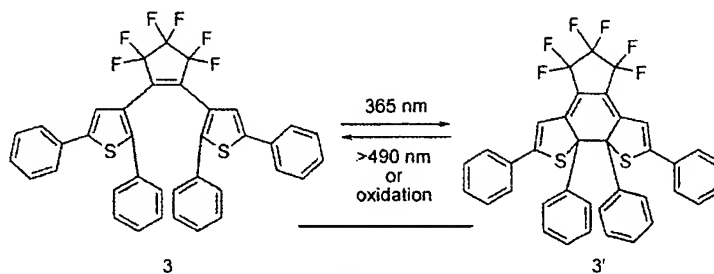
Scheme 9

Please replace the structural moiety labeled Scheme 10 at the middle of page 24 with the following replacement structural moiety:



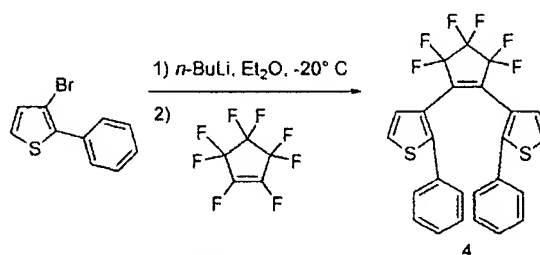
Scheme 10

Please replace the structural moiety labeled Scheme 11 at the top of page 26 with the following replacement structural moiety:



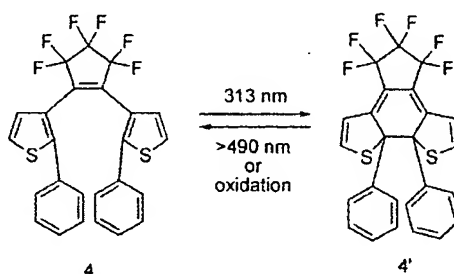
Scheme 11

Please replace the structural moiety labeled Scheme 12 at the middle of page 27 with the following replacement structural moiety:



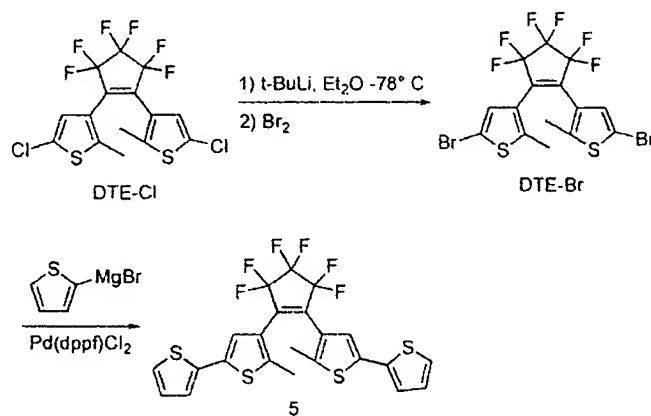
Scheme 12

Please replace the structural moiety labeled Scheme 12 at the middle of page 28 with the following replacement structural moiety:



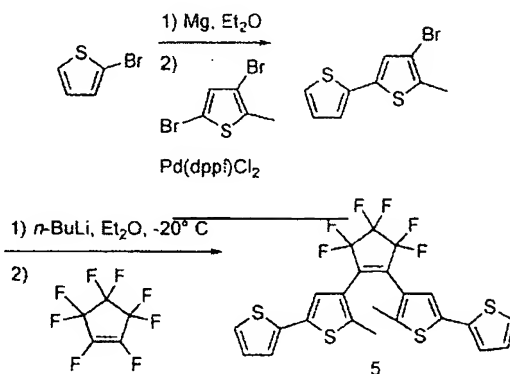
Scheme 12

Please replace the structural moiety labeled Scheme 13 at the bottom of page 29 with the following replacement structural moiety:



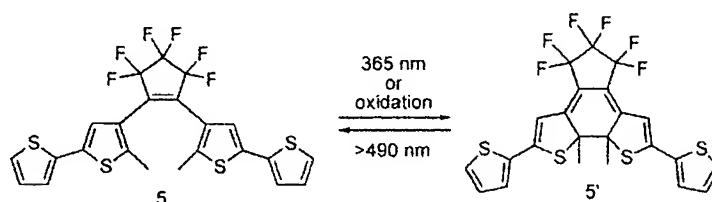
Scheme 13

Please replace the structural moiety labeled Scheme 14 at the top of page 31 with the following replacement structural moiety:



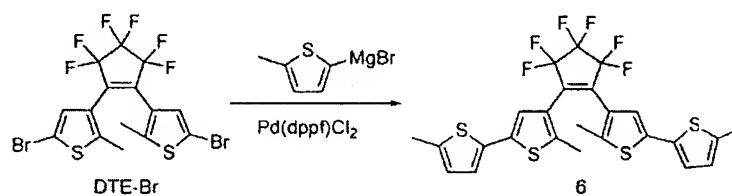
Scheme 14

Please replace the structural moiety labeled Scheme 15 at the middle of page 32 with the following replacement structural moiety:



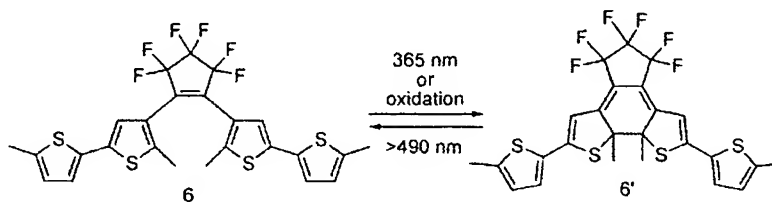
Scheme 15

Please replace the structural moiety labeled Scheme 16 at the bottom of page 33 with the following replacement structural moiety:



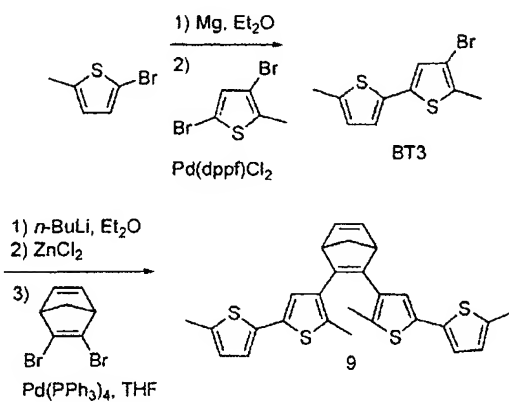
Scheme 16

Please replace the structural moiety labeled Scheme 17 at the middle of page 34 with the following replacement structural moiety:



Scheme 17

Please replace the structural moiety labeled Scheme 18 at the bottom of page 37 with the following replacement structural moiety:



Scheme 18